Holding support for vertebra - is of tubular form with an external screw thread and is made of titanium

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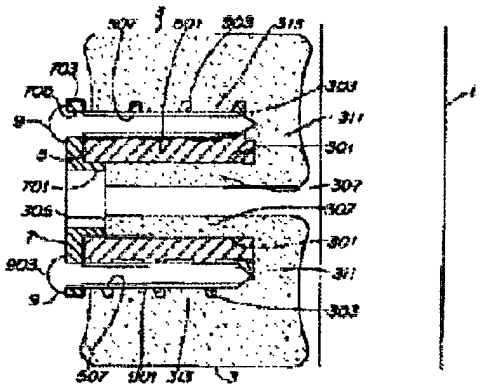
Abstract of **JP5269160**

PURPOSE:To stably fix vertebral bodies positioned in the upper and the lower parts of the resected intervertebral disk against force in the compression tensile direction and the direction being orthogonal to the compression tensile direction, in the case the intervertebral disk which becomes a disorder is resected, in a vertebra disease such as hernia of the intervertebral disk, etc. CONSTITUTION:The bone filling-up material is embedded extending over vertebral bodies 3, 3 positioned in the upper and the lower parts of the resected intervertebral disk, and provided with a hollow member 5 for positioning opposed parts 307, 307 of the vertebral bodies 3, 3 position in the upper and the lower parts of the resected intervertebral disk in its inside, and fixing means 9, 503 for fixing the hollow member 5 to the vertebral bodies 3, 3.



Result Page

The invention relates to an artificial eddy spacer, in order to each other hold adjacent vertebrae in a predetermined distance from each other, after a damaged volume disk in the region of the neck spinal column or the Lendenwirbelsäule became remote.

It is a medical operation known, which becomes performed at an patient, which suffers from a spinal column damage as for example a volume disk incident. With this medical operation the damaged volume disk of the front of the patient becomes ago remote. Subsequent one becomes an eddy spacer or a spacer between the two vertebrae inserted, which lie above and underneath the remote volume disk.

Available eddy spacers can consist and originate from different materials from the patient own bones, as for example the intestine leg up to bioceramic prostheses of alumina, Hydroxiapatit or such a thing.

With the described above medical operation those are cut off each other opposite portions above and the volume disk located vertebra remote underneath. Between the two vertebrae then ago the eddy spacer becomes inserted of the front of the patient, which fills the space between the vertebrae. This eddy filling element is in the layer to hold the vertebrae during load by compressive forces in their position. It is however less suitable to hold the vertebrae in their layer if tensile forces or forces become exerted on the vertebrae, which are vertical to these course or compressive forces directed.

From the WHERE 91/06261 A1 is an artificial eddy spacer known, which consists of an hollow element, whose outside, sharp edged structure penetrates into two each other adjacent vertebrae, which lie above and underneath a remote volume disk. Each other in each case directed portions of the vertebrae are disposed within the hollow element. Other eddy spacers are from US 5,015,247, US 4,961,740 and the FR 2,726,759 A1 known.

The invention is the basis the object to indicate an artificial eddy spacer which is in the layer to hold each other adjacent vertebrae to each other both against pressure and tensile forces and against such forces stable in their relative position which is vertical to the foregoing pressure and tensile forces mentioned directed.

This object becomes by the features dissolved indicated in the claim 1. Favourable developments are in the Unteransprüchen indicated.

The artificial eddy spacer according to invention covers an hollow element, which can become inserted into two each other adjacent vertebrae, which lie above and underneath a remote volume disk. Each other in each case the directed portions of the vertebrae lie within the hollow element, whereby this consists of a material, which possesses a predetermined mechanical strength and stiffness.

In accordance with a preferable embodiment of the invention the hollow element at its free end, which stands out with one another when inserting the hollow element into those to interconnecting vertebra from these, with a plate can be connected, which serves the attachment of the eddy spacer at the vertebrae. The hollow element can have for example a cylindrical shape, whereby it is provided with a screw bar at its outer circumference, one screwing the element in into the vertebrae allowed. The plate can be annular formed with an outer diameter, which is the essentially same outer diameter of the screw bar. In the plate and in the screw bar parallel to the axis of the cylindrical element directed, with one another aligned bores provided can be, in who screws are more insertable, in order to fasten the eddy spacer in its inserted position to the vertebrae.

The hollow cylindrical element, the plate and the screw bar can consist of a metallic material and be provided with a surface layer from a biocompatible material. The plate can be more releasable fixed with the cylindrical element connected or of this. If the plate is formed as part releasable of the cylindrical element, it is convenient, if it has an axial directed tubular approach, that into an end of the cylindrical element is importable and from that itself the plate a formed flange radial outward extended.

The screw bar can be integral with the cylindrical element formed.

The eddy spacer according to invention including the annular plate and at least a screw can consist for example of a titanium alloy.

Other favourable embodiments of the invention are in the Unteransprüchen indicated.

Other details and advantages of the invention result from the ensuing description, which in connection with the accompanying designs the invention on the basis embodiments explained. Show:

Fig. 1 the eddy axle a contained section by an eddy spacer according to invention in accordance with a first embodiment of the invention in the incorporated state with an annular plate and screws, as they become connecting adjacent vertebra used each other,

Fig. 2 a front view of the annular plate and the screws, which are connected with the artificial eddy spacer,

Fig. 3 a side view of the eddy spacer according to invention,

▲ top Fig. 4 the axis a contained section by an artificial eddy spacer,

Fig. 5 a front view of the artificial eddy spacer,

Fig. 6 a front view of the annular plate,

Fig. 7 the axis a contained section by the annular plate,

Fig. 8 a section by a modified embodiment of the annular plate,

Fig. 9 a plan view on an artificial eddy spacer in accordance with a second embodiment of the invention,

Fig. 10 a partial sectional side view of the eddy spacer in accordance with the second embodiment,

Fig. 11 a side view of the eddy spacer in accordance with the second embodiment,

Fig. 12 a plan view on an artificial eddy spacer in accordance with a third embodiment of the invention,

Fig. 13 a partial cut front side opinion of the eddy spacer in accordance with the third embodiment,

Fig. 14 a side view of the eddy spacer in accordance with the third embodiment,

Fig. 15 a plan view on an eddy spacer in accordance with a fourth embodiment of the invention,

Fig. 16 a partial cut front side opinion of the eddy spacer in accordance with the fourth embodiment,

Fig. 17 a side view of the eddy spacer in accordance with the fourth embodiment.

The inventive arrangement serves in particular for the incorporation as artificial eddy spacers, in order to interconnect and hold in a predetermined distance adjacent vertebrae each other after the removal a volume disk located between them. This eddy spacer can in particular in the region of the Halswirbel and the Lendenwirbel in in the Fig. 1 represented manner used become.

In accordance with the illustration in the Fig. the spinal column the spinal cord 1 and a number of vertical disposed vertebrae 3 covers 1 and 2 one above the other. In the illustration of the Fig. 1 and 2 is a defective volume disk between each other adjacent vertebrae 3 remote. An eddy spacer according to invention 5 is into the vertebrae 3 inserted and the bridged distance between each other adjacent vertebrae. The spacer is at the vertebrae 3 by means of an annular plate 7 and two screws 9 attached.

After the illustration of the Fig. 3, 4 and 5 covers the artificial eddy spacers 5 an hollow cylindrical element 501 as well as a screw bar 503 with trapezoidal cross section, which is fixed 501 connected with the cylindrical element, is if necessary integral with this formed and surrounds the cylindrical element 501 helical, so that it is away radial from this. If the artificial eddy spacers 5 into the vertebrae 3 inserted is, an outer end at the fronts of the vertebrae stands out 3 from these. In accordance with Fig. 1 is the length of the hollow cylindrical element 501 so selected that after the insertion of the element into the vertebrae 3 its inner end short before the rear is appropriate, for the spinal cord 1 facing surfaces of the vertebrae 3, so that eddy sections 311 between the inner end of the cylindrical element 501 and the rear outer surfaces of the vertebrae 3 remain. The hollow cylindrical element 501 has a plurality of radial holes 505, which are formed in the wall of the element and which interconnect the inner peripheral surface and the outer peripheral surface of the cylindrical element 501.

In accordance with the illustration in Fig. the screw bar has 5 503 six screw holes 507, which are in uniform angular intervals disposed around the cylindrical element 501 around. The screw holes or threaded bores 507 extend parallel to the axis of the hollow cylindrical element 501.

The artificial eddy spacers 5 is from a titanium alloy manufactured and with a calcium phosphate connection coated, which is in the represented embodiment of porous Hydroxiapatit.

After the illustrations of the Fig. the annular plate 7 covers itself 6 and 7 diameter-smaller tubular element 701 and an annular flange 703, that from an axial end of the tubular element 701 radial outward extended.

The tubular element 701 has an outer diameter, which is small enough, so that it fits into the hollow cylindrical element 501. The outer diameter of the annular flange 703 essentially corresponds to the outer diameter of the screw bar 503. The annular flange 703 has six Einstecklöcher 705, which are in same angular intervals in circumferential direction successive disposed. The Einstecklöcher 705 are in their size identical with the screw holes 507 in the screw bar 503 and aligning in each case with these.

The annular plate 7 is from a titanium alloy manufactured and coated with a calcium phosphate connection, which is in the represented embodiment of porous Hydroxiapatit.

Everyone of the screws 9 covers a shaft 901 and an head 903 at an end of the stem 901, like this Fig. 1 shows.

The shaft 901 of each screw 9 has with an external thread provided surface and can into the screw holes 507 in the screw bar 503 be screwed in. The shaft 901 of each screw 9 is so prolonged that it can be so far put through through one of the Einstecklöcher 705 and one of the screw holes 507 aligned thereby that its tip the distal end of the artificial eddy spacer 5 achieved, whereby the screw head 9 rests against the outer surface of the annular plate 7.

Everyone of the screws 9 is from a titanium alloy manufactured and coated with a calcium phosphate connection, which consists in the represented embodiment of porous Hydroxiapatit.

A method for connecting two adjacent vertebra 3, which lie above and underneath a remote damaged volume disk with a distance from each other, becomes now in the following on the basis the Fig. 1 described.

First an annular groove becomes 301 simultaneous in both each other adjacent vertebrae 3 manufactured. This annular groove 301 is so dimensioned that it can take up the hollow cylindrical element 501 with narrow seat. Furthermore an helical groove becomes 303 simultaneous in both each other adjacent vertebrae 3 manufactured. The dimensions of this groove are so selected that the screw bar 503 narrow into this helical groove 303 fits. The helical groove 303 is located itself in connection with the annular groove 301 and extended from this radial outward.

Subsequent ones become two small holes in the vertebrae 3 generated. Their diameter is a small as that of the screw holes 507. Their length corresponds to the length of the screws 9. These two small holes extend by the helical groove 303 and are appropriate each other for diametric opposite in alignment with two of the six screw holes 507, which lie one above the other toward the Rückenenmarks, after the artificial eddy spacers 5 rotated became, over the hollow cylindrical element 501 and the screw bar 503 into the annular groove 301 and/or. to introduce the helical groove 303.

At the fronts that each other opposite portions of the vertebrae 3 recesses become the receptacle of the tubular element 701 of the annular plate 7 manufactured.

Subsequent ones become the hollow cylindrical element 501 and the screw bar 503 axial into the annular groove 301 and/or. the helical groove 303 introduced, while the artificial eddy spacers 5 rotated around its axis becomes. The spacer becomes continuous rotated, over the hollow cylindrical element 501 and the screw bar 503 complete into the annular groove 301 and/or. to introduce the helical groove 303, D. h. until the outer end of the artificial eddy spacer gets over 5 only slight ones over the front surfaces of the vertebrae 3. Now each other opposite portions 307 the vertebra 3, which follow the respective eddy section 311, within the hollow cylinder 501 lie. The rotation of the artificial eddy measuring rod 5 becomes interrupted, whereby the screw holes 507 now in alignment with the two diameter-smaller bores in the respective vertebrae 3 lie.

Then the tubular element 701 of the annular plate becomes 7 into the hollow cylindrical element 501 introduced and into the recesses 305 inserted. The annular plate 7 will rotated, in order to bring the Einstecklöcher to 705 in alignment with the corresponding screw holes 507.

The two screws 9 become subsequent into the respective Einsteckloch 705 set and into the screw holes 507 as well as the diameter-smaller holes in the vertebrae 3 rotated, aligned with them. The screws 9 become tightened, until their heads 903 rest against the outer surface of the annular plate 7.

Since the artificial eddy spacers 5 into the vertical spaced vertebrae 3 embedded is and at this attached and since opposite portions 7 the vertebra 3 within the hollow cylindrical element 501 lie each other, can take up the artificial eddy spacers 5 toward the spinal column axle acting compressive forces, tensile forces and vertical to this pressure and tensile forces forces, which become on the vertebrae 3 exerted. Even if mentioned become exposed therefore the vertebrae the foregoing forces, they become maintained of the artificial eddy spacer 5 stable in their position. After the artificial eddy spacers 5 it was implanted the bone tissue of the portions 307 the vertebra 3 located within the cylindrical element 501 grows so far that those grow together with one another each other opposite portions 307. Therefore the vertebrae 3 stable can be held together.

The bone tissue of the vertebrae 3 steps 505 in the hollow cylindrical element 501 with its growth also into the holes. Therefore also the portions 307 the vertebra 3 and the radial 501 eddy sections 313 by the holes 501 located remained within the hollow cylindrical element 501 outside of the cylindrical element grow together and hold thereby the vertebrae 3 stable in their layer. Since the coating from a calcium phosphate connection on the hollow element is 501 to a considerable degree biocompatible, the bone tissue of the vertebrae 3 easy into the holes 505 can grow, which growing together between the portions 307 the vertebra 3 within the element 501 and the radial eddy section 313 facilitated located outside of the element 501.

Both the artificial spacers 5, the annular plate 7 and the screws 9 are from a titanium alloy manufactured and coated with a calcium phosphate connection, as this described above became. The artificial spacers 5, the annular plate 7 and the screws 9 are relative easy. Since the calcium phosphate connection has an high propensity to the connection with the bone, the surface coating of the spacer 5 of the annular plate 7 and the screws 9 good with the vertebrae 3 can grow together with the result that the artificial eddy spacers reliable in the vertebrae can become 3 anchored.

The mechanical strength and stiffness of the artificial eddy spacer 5 will by the annular plate 7 and the screws 9 increased, in order to hold the vertebrae 3 stable in their position.

Fig. a modified annular plate 71 shows 8. This covers itself a part-cylindrical flange 713, that from an end of a tubular element 701 radial outward extended. The flange 713 has six Einstecklöcher 715, which are in same angular intervals from each other disposed. To the use of the modified annular plate 71 the front end faces of the vertebrae 3 are cut off, so that they have part-cylindrical recesses, which are in their form of complementary to the part-cylindrical flange 713.

When using the part-cylindrical flange 713 narrow fits into the so formed recesses. Consequently the modified annular plate 71 not substantial exceeds over the vertebrae 3.

The artificial eddy spacers 5 inserted can become into each other adjacent vertebrae 3, while a spacer or a filler material, which can grow together to biocompatible with the bones or is, between which opposite portions 307 the vertebra 3 disposed each other is.

In the represented embodiment becomes the artificial eddy spacers 5 attached at the vertebrae 3 the increase of the mechanical strength and stiffness 9 strengthened by the annular plate 7 and the screws. However the annular plate 7 and the screws 9 can also be void.

The artificial eddy spacers 5 attached can become at the vertebrae 3 in many way. For example the cylindrical element 501 can be provided with an external thread and be become in the vertebrae 3 by the thread effect held. Alternative one in addition can have the hollow cylindrical element of 501 at one its ends a flange, whereby the spacer becomes 5 at the vertebrae 3 by screws attached, which extend by the flange and are screwed in into the vertebrae 3. If the annular plate 7 and the screws 9 are void, the hollow cylindrical element 501 can a higher wall thickness possess or of another material consist, in order to increase the mechanical strength and stiffness of the artificial eddy spacer 5.

The spacer 5 must an hollow rectangular shape not necessarily in form of an hollow cylindrical element formed be, but can also have.

The Fig. 9 to 11 shows an artificial eddy spacer in accordance with a second embodiment of the invention.

The general eddy spacers in accordance with the second embodiment, designated with 21, covers an hollow cylindrical element 25 and a flange 27, which are integral with an end of the element 25 connected. The element 25 has a screw bar or an helical rib 2501 at its outer peripheral surface.

The length of the cylindrical element 25 is a so selected that with its insertion into each other adjacent vertebrae 3 (see Fig. 1 and 2) its

inner distal end short before the rear surfaces of the vertebrae 3 is appropriate, for D. h. short before the surfaces, which to the spinal cord 1 refer to. Thus eddy sections 311 between the inner end of the cylindrical element 25 and the rear surfaces of the vertebrae 3 remain. The cylindrical element 25 has a plurality of radial holes 2502, which are formed in its wall and interconnect which inner peripheral surface and the outer peripheral surface of the hollow cylindrical element 25. At its flange 27 opposite end the cylindrical element 25 has itself a tapering outer surface 2503, so that the element of 25 easy into the vertebrae 3 can penetrate and into these inserted can become thus easier.

The flange 27 has a rectangular shape, whereby Einstecklöcher 2701 at the corresponding four corners of the flange are 27 formed. In accordance with the illustration in Fig. the flange 27 has 11 a partial cylindrical surface 2703 at its outside, which is the cylindrical element 25 remote.

By the corresponding screw putting in holes 2701 screws 29 into the vertebrae 3 can be screwed in, in order to fasten the spacer 21 to the vertebrae 3.

The spacer 21 and the screws 29 are coated from a titanium compound manufactured and not with a calcium phosphate connection.

Two each other adjacent vertebrae 3, which are above and disposed underneath a remote defective volume disk, can become by means of the artificial eddy spacer 21 in the subsequent manner connected so with one another that they have a distance from each other.

First becomes manufactured as with the first embodiment an annular groove in the two vertebrae, which is so dimensioned that the hollow cylindrical element 25 exact fits into this groove. Then the artificial eddy spacers 21 into the annular groove inserted become, while it becomes rotated, until the spacer 21 in the vertebrae 3 sits. Helical groove to the appropriate receptacle of the screw bar 2501 can become in the two each other adjacent vertebrae 3 manufactured, before the hollow cylindrical element becomes 25 inserted into the annular groove, so that the screw bar 2501 in the helical groove received becomes, if the artificial eddy spacers 21 into the vertebrae 3 inserted becomes. Alternative one for this can be void the formation the helical groove. The internal thread in the vertebrae 3 can become by a cutting screw bar 2501 cut, if the hollow cylindrical element bottom rotation becomes inserted into the annular groove.

Subsequent ones become four narrow holes, whose diameter is smaller than the diameter of the screw putting in holes 2701 and their length of the length of the screws 29 corresponds, in the vertebrae 3 manufactured. These four small holes can become gleichzeitg with the production of the annular groove in the vertebrae 3 drilled. The screws 29 become subsequent by the respective screw putting in holes 2701 inserted and into the small bores in the vertebrae 3 screwed. The screws 9 become tightened, until their heads rest against the outer surface of the flange 27.

Since the artificial eddy spacers 21 into the two vertical spaced vertebrae 3 inserted is and at this attached and since opposite portions 7 the vertebra 3 within the hollow cylindrical element 25 lie each other, 21 compressive forces, tensile forces as well as vertical can take up directed forces, which become on the vertebrae 3 exerted to the artificial eddy spacers to this. Even if therefore the vertebrae become 3 the foregoing forces mentioned exposed, they become maintained stable in their position by the artificial eddy spacer 21. After the spacer became 21 inserted, the bone tissue of the eddy sections remained within the hollow cylindrical element 25 grows so far that these eddy sections grow together with one another. Consequently the vertebrae 3 stable are held together.

The bone tissue of the vertebrae 3 occurs with its growth the holes 2502 the wall of the hollow cylindrical element 25. Due to its eddy sections remained within the cylindrical element 25 and the radial grow together with one another outside of the same located eddy sections by the holes 2502, so that the vertebrae 3 become stable maintained in their position.

On the basis the Fig. 12 to 14 now a third embodiment of an eddy spacer according to invention described becomes.

The general artificial eddy spacers in accordance with the third embodiment, designated with 31, differs from the spacer 21 in accordance with the second embodiment concerning the flange, which is connected with the hollow cylindrical element.

The spacer 31 covers an hollow cylindrical element of 35 as well as two diametric each other opposite flanges 37, which are 35 integral connected with an end of the hollow cylindrical element. The hollow cylindrical element 35 carries a screw bar or an helical rib 3501 on its outer peripheral surface and has a plurality of radial holes 3502, which interconnect the inner peripheral surface and the outer peripheral surface of the element 35. Its outer peripheral surface 3503 tapered itself in the direction of the end, which is that the flanges supporting end of the cylindrical element 35 remote.

The flanges 37 are away radial after each other diametric opposite sides of the hollow cylindrical element 35. Each flange 37 is essentially rectangular formed and has two screw putting in holes 3701 close its outside distal end. Like Fig. , has the artificial eddy spacers 31 a partial cylindrical surface 3703 at the end shows 14, are 37 formed at which the flanges, whereby the part-cylindrical surface 3703 changes into the outer surfaces of the flanges 37.

Like Fig. the axes 3701A of the screw putting in holes 3701 show, are 13 concerning the axis of the hollow cylindrical element 35 so inclined that screws 39, which become by the screw putting in holes 3701 to the attachment of the spacer 31 at the vertebrae 3 inserted with their tips oblique from each other away wise.

The artificial eddy spacers 35 and the screws 39 are coated from a titanium compound manufactured and not with a calcium phosphate connection.

The Fig. 15 to 17 shows an artificial eddy spacer in accordance with a fourth embodiment of the current invention.

The general spacers designated with 41 it differs from the spacer 31 in accordance with the third embodiment in the fact that he has only a single flange.

In detail covers the artificial spacers 41 an hollow cylindrical element 45 as well as a flange 47, which are 45 integral with this connected, at an end of the element. The hollow cylindrical element 45 carries a screw bar or an helical rib 4501 at its outer peripheral surface and has a variety of radial holes 4502, which interconnect the inner peripheral surface and the outer peripheral surface of the hollow cylindrical element 45. The outer peripheral surface 4503 of the hollow cylindrical element tapered itself progressive in a direction, which points from that the flange 47 to supporting end of the hollow cylindrical element 45 away.

The flange 47 is away from a side of the hollow cylindrical element 45 radial. It has one essentially rectangular shape as well as two screw putting in holes 4701, which are close its outside distal end formed. The axes 4701A of the screw putting in holes 4701 are so in each case

inclined that 45 inclined by these holes inserted screws 49 are concerning the axis of the hollow cylindrical element. Like Fig. , has the artificial eddy spacers 41 at the end of the hollow cylindrical element 45 connected with the flange 47 a part-cylindrical surface 4703, which changes into the outer surface of the flange 47, shows 17.

In accordance with Fig. the hollow cylindrical element 45 a sloping surface 4509 at its has 16 the flange 47 opposite side.

The artificial eddy spacers 41 and the screws 49 are coated from a titanium alloy manufactured and not with a calcium phosphate connection.

Result Page

1. To become artificial eddy spacer, a comprising hollow element (501), which in addition suitable and certain is, into two each other adjacent vertebrae (3) inserted, which above and underneath a remote volume disk are appropriate, whereby directed portions (307) lie each other in each case the vertebra (3) within the hollow element (501) and whereby the hollow element (501) of a material consists of predetermined mechanical strength and stiffness, thus characterized,
that a plate (7) is provided, which is connected with an end of the hollow element (501),
that the hollow element (501) on its outer peripheral surface carries a screw bar (503), is formed in which at least one screw drilling (507), itself by the screw bar (503) the parallel to the axis of the hollow element (501) extended,
that the plate (7) is in form of a ring formed, its outer diameter essentially same outer diameter of the screw bar (503) is,
and that in the plate (7) at least one screw putting in hole (705) is in such a manner formed that the plate (7) with a screw (9), which is fastenable the screw putting in hole (705) and the screw drilling (507) in the screw bar (503) penetrated, at the hollow element (501).

2. Artificial eddy spacer according to claim 1, characterised in that the hollow element (501, 25, 35, 45) in its wall of holes (505, 2502, 3502, 4502) has, which the inner peripheral surface of the hollow element (501, 25, 35, 45) with its outer peripheral surface to connect.

3. Artificial eddy spacer according to claim 1 or 2, characterised in that the hollow element (501, 25, 35, 45) one essentially cylindrical shape has.

4. Artificial eddy spacer after one of the claims 1-3, characterised in that the screw bar (503) a trapezoidal cross section has.

5. Artificial eddy spacer after one of the claims 1 to 4, characterised in that the hollow element (501, 25, 35, 45) of a metallic material consists.

6. Artificial eddy spacer after one of the claims 1 to 5, characterised in that the plate (7) of metallic material consists.

7. Artificial eddy spacer after one of the claims 1 to 5, characterised in that of metallic material consist the screws (9).

8. Artificial eddy spacer after one of the claims 5 to 7, characterised in that the metallic material a titanium alloy is.

9. Artificial eddy spacer after one of the claims 1 to 8, characterised in that the plate (7, 71) an engagement portion (701), which into an axial end of the spacer is more insertable, and a flange (703, 713) covers itself, the outward extended radial of the tubular element (701), and at least an hole to the receptacle of a screw (9) has, in order to fasten the flange (703, 713) to a vertebra (3), if the artificial eddy spacers into the vertebrae (3) embedded becomes.

10. Artificial eddy spacer according to claim 1, characterised in that the plate in form of a flange formed is, which is integral with this formed, at an end of the hollow element (25, 35, 45), and is away radial from this, whereby in the flange (27, 37, 47) at least a threaded bore (2701, 3701, 4701) is provided for screwing a fixing screw (29, 39, 49 in).

11. Artificial eddy spacer according to claim 10, characterised in that itself the outer peripheral surface of the hollow element (35, 45) to that the flange (37, 47) far end of the hollow element (35, 45) tapered.

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